DPM 5519

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

REC'D JAN 05 1988

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: Handy & Harman	EMERGENCY TELEPHONE NO.: (212) 207-2632
ADDRESS (Number, Street, City, State, and ZIP Code): 850 Third Avenue, New York, NY 10022	
CHEMICAL NAME AND SYNONYMS: Silver Brazing Flux	TRADE NAME AND SYNONYMS: Handy Hi-Temp Flux;AWS Type FB 3D
CHEMICAL FAMILY: Fluorides and Borates	FORMULA:

SECTION II - HAZARDOUS INGREDIENTS *

Filler Metal & Flux Components	CAS#	% (+)	ACGIH** TLV-TWA	Decomposition Products	CAS#	% (+)	ACGIH** TLV-TWA
Potassium Fluoborate (KBF_4)	14075-53-7	< 6	2.5mg/m^3	Boron Trifluoride (BF_3)	7637-07-2	< 3.5	1ppmC***
Potassium Hydroxide (KOH)	1310-58-3	<12	2. "*** C	Hydrogen Fluoride (HF)	7664-39-3	< 4.	3ppm
Boric Acid (K_3BO_3)	10043-35-3	< 6	N.A.	Potassium Fluoride (KF)	7789-23-3	<12.	2.5mg/m^3
Potassium Pentaborate (KB_5O_8)	11128-29-3	<60	N.A.	Boron Oxide (B_2O_3)	1303-86-2	<50.	10.mg/m^3
Water (H_2O)	7732-18-5	<30	N.A.				

(+) Exact reaction is not known, therefore percentages listed are maximum values possible.
* Thought should also be given to the filler metal and base metals being joined and to possible base metal coating which could emit fumes on heating, depending on their particular chemistry.
** Approximate milligrams of substance per cubic meter of air or parts per million- Time weighted average per workday. (See ANSI/AWS F1.1- for sampling and testing methods).
*** C Denotes "Ceiling Limit" = not to be exceeded at any time.

BOILING POINT (°F.)	212°F	SPECIFIC GRAVITY (H_2O=1)	1.7
VAPOR PRESSURE (mm Hg.)	N.A.	PERCENT, VOLATILE BY VOLUME (%)	N.A.
VAPOR DENSITY (AIR=1)	N.A.	EVAPORATION RATE (_____ =1)	N.A.
SOLUBILITY IN WATER	N.A.		
APPEARANCE AND ODOR	White paste - no odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	N.A.	FLAMMABLE LIMITS	LEL: N.A.	UEL:
EXTINGUISHING MEDIA	N.A.			
SPECIAL FIRE FIGHTING PROCEDURES	N.A.	N.F.P.A. Code No. 704:		
		Hazard	Color Code	Signal No.
UNUSUAL FIRE AND EXPLOSION HAZARDS	N.A.	Health	(Blue)	1
		Flammability	(Red)	0
		Reactivity	(Yellow)	1

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUES: TLV Inhalation for fluoride is 2.5 mg/m^3 or 3 ppm of air; TLV for KOH is 2 mg/m^3 ceiling; TLV for Boron Oxide = 10 mg/m^3; TLV for BF_3 is 1 ppm ceiling.

MAJOR EXPOSURE HAZARD - INAHALATION

CUMULATIVE LIMITS: Welding (Brazing) Fumes - Total particulate ($C_1 + C_2 + \ldots C_N$) $\leq$ 5 mg/m^3; (C=Concentration: T=TLV) $C_1/T_1 + C_2/T_2 + \ldots C_N/T_N \leq 1$); See Section IX

EFFECTS OF OVEREXPOSURE: Toxic fluorides are poisonous if swallowed TXDS-orl-rat LD5o; 245 mg/m^3 Lethal oral dose infants 2 to 3 grams, adults 10-15 grams. KOH is both toxic (TXDS: orl-rat-LD5o: 365 mg/m^3 and an irritant. Prolonged and continual contact may cause dermatitis. Overexposure to decomposition products on heating (largely Boron Trifluoride Gas) is Toxic TXDS: ihl-rat-LCLo: 750 ppm/5.5H.

EMERGENCY AND FIRST AID PROCEDURE: Victims of acute overexposure to fume (unlikely in ordinary usage) should be removed from contamination area, and given artificial respiration if breathing has stopped. If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person. Wash exposed areas of skin or eyes with large quantities of water.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Stable at room temperature

INCOMPATABILITY: N.A.

HAZARDOUS DECOMPOSITION PRODUCTS: HF and BF_3 gas on heating during brazing. Also B_2O_3 (See Section V).

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Avoid contact with skin or eyes. Dilute and wash spillage with water. Avoid high temperature. Wear rubber gloves during spill clean-up.

WASTE DISPOSAL METHOD: All effluent ingredients are inorganic. Biodegradability N/A. Local regulations may require the removal of fluorides and suspended trace metals before discharge of final effluent. Chemical precipitation by addition of lime or other reagents, followed by removal of the precipitate by settling and/or filtration has proven simple and effective. The resulting precipitate containing Calcium Fluoride and Metal Carbonates (or Hydroxides) should be tested to determine if it is a hazardous waste, or, not. Dispose of only, through a licensed disposal firm, at a secure chemical landfill location.

SECTION VIII- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: None for brazing in properly ventilated area. In confined space use an airline respirator or hose mask, NIOSH, U.S. Bureau of Mines approved hose Type C or self-contained air respirator.

VENTILATION: (For fumes & gases.)	LOCAL EXHAUST:	Air flow to produce velocity of 100 lineal Ft./min in brazing zone.
	MECHANICAL:	2,000 cu. ft./min/brazer (see footnote).
	NATURAL (MIN):	10,000 cu. ft./brazer - 16ft. ceiling - No obstructions.

PROTECTIVE GLOVES: Leather welding gloves.

EYE PROTECTION: Plastic frame safety spectacles with side shields - filter lenses shade #3 or 4.

OTHER PROTECTIVE EQUIPMENT: Normal clothing for torch brazing. (Avoid flammable fabrics)

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Maintain flux at normal room temperature. Flux should be used with the recommended temperature of (1600 - 2000°F) This flux is often used with brazing filler metals containing cadmium. Cadmium oxide fume (TLV=.05 mg/m^3 is a greater hazard than fluoride fume from flux. Zinc oxide fume may also be emitted from the filler metal during brazing. (TLV = 5 mg/m^3).

FOOTNOTE: 1) Refer to ANSI Z49.1, "Safety in Cutting and Welding", published by the American Welding Society, P.O. Box 351040, Miami, FL 33135

2) Handy Hi-Temp Flux is not classified as a hazardous material and there are no D.O.T. Shipping Restrictions in C.F.R. 49 (No D.O.T. Shipping Name or UPS UN No.)

12/31/85

EMERGENCY AND FIRST AID INSTRUCTIONS

Inhalation: Move victim to fresh air. Give artifical respiration, if necessary. If the nose is bleeding put absorbent material (like cotton) into the nasal openings. Do not pack the nostrils. Change the material often. Seek medical attention.

Skin: Remove soiled clothing. Wash skin with soap and water for at least 5 minutes, followed by a boric acid solution. Seek medical attention, if necessary.

Eyes: Wash eyes with slow, steady stream of water for at least 15 minutes, followed by a boric acid solution. Seek medical attention immediately.

Ingestion: Seek immediate medical attention. Give magnesium hydroxide gel. if conscious.

Note to Physician: Urinary fluoride excretion levels have been useful in evaluating industrial exposures to fluoride dusts.

FIRE AND EXPLOSION INFORMATION

General: Not flammable or explosive.

REACTIVITY

Materials to Avoid: Avoid acids. Reacts to form hydrogen fluoride, which is a highly corrosive and poisonous gas.

Conditions to Avoid: Avoid high temperatures. Compound will break down.

PROTECTIVE MEASURES

Storage and handling: Store in a cool, dry area that is well ventilated. Protect from damage. Avoid acids.

Engineering Controls: Use only with an effective and properly maintained exhaust ventilation or with a fully enclosed process. Sinks, showers and eye wash stations should be readily available.

Protective Clothing (Should not be substituted for proper handling and engineering controls): If direct contact is possible, wear protective clothing, gloves and goggles.

Protective Equipment: For exposure up to 12.5 mg/m^3 use a dust mask. For up to 25 mg/m^3 use a supplied-air or self-contained breathing device. For up to 125 mg/m^3 use a supplied-air respirator with a facepiece, helmet or hood. For up to 250 mg/m^3 use a supplied-air device in pressure demand or other positive pressure or continuous flow mode. To escape a contaminated area use a gas mask with an organic vapor canister or a self-contained breathing device.

Miscellaneous: Remove any clothing that you think may have become chemically soiled and wash before reuse.

PROCEDURES FOR SPILLS AND LEAKS

Get all workers out of the spill area. Enter only with protective clothing and devices. Treat with soda ash or slaked lime. Neutralize with weak hydrochloric acid. Use an industrial vacuum cleaner to remove the spill. Clean up with soap and water is allowed only if exposure and contamination are not increased to above the recommended levels. For final disposal contact your regional office of the New York State Department of Environmental Conservation.

For more information: Contact the Industrial Hygienist or Safety Officer at your worksite or the New York State Department of Health, Bureau of Toxic Substance Assessment, Empire State Plaza, Tower Building, Albany, New York 12237.

"Chemical Fact Sheet"

SODIUM FLUORIDE **

The information in this sheet applies to workplace exposure resulting from processing, manufacturing, storing or handling and is not designed for the population at large. Any generalization beyond occupational exposures should not be made. The best industrial hygiene practice is to maintain concentrations of all chemicals at levels as low as is practical.

Chemical Names: CAS 7681-49-4.

Trade Names: Floridine, Florocid, T-Fluoride, Flure-Drops, Flursol, Karidium, Loride, Pergantene and others.

Uses: Insecticides for roaches and ants; in other pesticide formulae;in electroplating and glass manufacturing.

PHYSICAL INFORMATION

Appearance: Colorless crystals or white powder.

Behavior in Water: Very soluble.

HEALTH HAZARD INFORMATION

OSHA Standard: Average 8 hour exposure -- 2.5 mg/m^3 (total inorganic fluorides).

NIOSH Recommended Limit: Average 10 hour day/40 hour week exposure -- 2.5 mg/m^3 (total inorganic fluorides).

ACGIH Recommended Limit: Average 8 hour exposure -- 2.5 mg/m^3 (total inorganic fluorides).

Short Term Exposure:

Inhalation: May cause difficult breathing, burning of the mouth, throat and nose, which can result in bleeding. These may be felt at 7.5 mg/m^3. Nausea vomiting, profuse sweating and excess thirst may occur at higher levels.

Skin: May cause rash, itching and burning of skin. Solutions of 1% strength may cause sores if not removed promptly.

Eyes: May cause severe irritation.

Ingestion: Most reported instances of fluoride toxicity are due to accidental ingestion and it is difficult to associate symptoms with dose. 5 to 40 mg may cause nausea, diarrhea, and vomiting. More severe symptoms of burning and painful abdomen, sores in mouth, throat and digestive tract , tremors, convulsions and shock will occur around a dose of 1 gm. Death may result by ingestion of 2 to 5 grams.

Long Term Exposure:

Fluoride may increase bone density, stimulate new bone growth or cause calcium deposits in ligaments. This may become a problem at levels of 20 to 50 mg/m^3 or higher. Mottling of tooth enamel may also occur.

*Prepared by the Bureau of Toxic Substance Assessment, New York State Department of Health. For an explanation of the terms and abbreviations used, see "Toxic Substances: How Toxic is Toxic" available from the New York State Department of Health.

**POTASSIUM FLUORIDE SHOULD EXHIBIT SIMILAR EXPOSURE CHARACTERISTICS

Chemical Fact Sheet*

Version 2 - June 1984

SODIUM HYDROXIDE **

The information in this sheet applies to workplace exposure resulting from processing, manufacturing, storing or handling and is not designed for the population at large. Any generalization beyond occupational exposures should not be made. The best industrial hygiene practice is to maintain concentrations of all chemicals at levels as low as is practical.

Chemical Names: Caustic soda, sodium hydrate, white caustic; CAS 1310-73-2.

Trade Names: Ascarite, Collo-grillrein, Collo tapetta and others.

Uses: Used to neutralize acids; in the manufacture of rayon, cellophane, soap and others.

PHYSICAL INFORMATION

Appearance: A white solid in the form of flakes, pellets, cakes, chips or sticks. Also available as a clear, colorless water solution.

Odor: None.

Behavior in Water: Very soluble in water.

HEALTH HAZARD INFORMATION

OSHA Standard: Average 8 hour exposure -- 2 mg/m^3.

NIOSH Recommended Limit: Average 8 hour exposure -- 2 mg/m^3.

ACGIH Recommended Limit: 2 mg/m^3.

Short Term Exposure:

Inhalation: Can cause severe irritaion of the nose and throat and inflammation of the lungs.

Skin: Can cause deep burns and severe irritation.

Eyes: Can cause severe irritation, corneal burns and blindness.

Ingestion: Can cause burning of the mouth and throat, nausea, vomiting, abdominal pains and diarrhea (occasionally with blood). Can also cause swelling of the larynx and subsequent suffocation, holes in stomach and intestines, heart failure, coma. Death has resulted from swallowing less than 1/3 ounce of the solid.

Long Term Exposure:

Skin irritation may develop from repeated exposure to the solid or low concentrations of the liquid. Irritation to the lungs, nose, throat and mouth may occur if exposed to low levels for long periods of time.

*Prepared by the Bureau of Toxic Substance Assessment, New York State Department of Health. For an explanation of the terms and abbreviations used, see "Toxic Substances: How Toxic is Toxic" available from the New York State Department of Health.

**POTASSIUM HYDROXIDE SHOULD EXHIBIT SIMILAR EXPOSURE CHARACTERISTICS

EMERGENCY AND FIRST AID INSTRUCTIONS

Inhalation: Get victim to fresh air. Give artificial respiration if necessary. Seek medical attention.

Skin: Wash contaminated area with running water until the "soapy" feeling disappears. Seek medical attention, if necessary.

Eyes: Wash eyes with running water for at least 15 minutes. Seek immediate medical attention.

Ingestion: Do not induce vomiting. Give large amounts of water or milk. Seek immediate medical attention. Note: Never force an unconscious person to drink.

Note to Physician: Dilute with water, milk or weak acid. Gastric lavage and emetics are contraindicated. As soon as pain and shock are controlled, presence or absence of esophageal injury should be determined.

FIRE AND EXPLOSION INFORMATION

General: Non-flammable or explosive

REACTIVITY

General: Extremely corrosive.

Materials to Avoid: Separate from acids, metals, explosives, organic peroxides and easily ignitible materials; contact may release heat and poisonous gases.

Conditions to Avoid: When the solid comes in contact wih moisture or water, it can generate enough heat to ignite combustible materials.

PROTECTIVE MEASURES

Storage and Handling: Store in a dry place. Protect container from water or moisture and against physical damage.

Engineering Controls: Use in an area that is dry or has a dehumidifer. Eyewash stations and showers should be readily available.

Protective Clothing (Should not be substituted for proper handling and engineering controls): If contact is likely wear rubber gloves, aprons, boots and safety glasses.

Protective Equipment: For levels up to 100 mg/m^3 use a high-efficiency particulate respirator with a full facepiece, a supplied-air respirator with a full facepiece, helmet or hood, or a self-contained breathing appartus with a full facepiece. For up to 200 mg/m^3 use a powered air-purifying respirator with a high-efficiency filter and full facepiece or a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode. For escape from a contaminated area use a dust and mist respirator or a self-contained breathing appartus with a full facepiece.

PROCEDURES FOR SPILLS AND LEAKS

Wear protective clothing. For the solid, sweep into large vessel containing a large amount of water. Neutralize with weak hydrochloric acid. For solution, neutralize with weak hydrochloric acid. Pick up with mop or water vacuum. For final disposal contact your regional office of the New York State Department of Environmental Conservation.

For more information: Contact the Industrial Hygienist or Safety Officer at your worksite or the New York State Department of Health, Bureau of Toxic Substance Assessment, Empire State Plaza, Corning Tower Building, Albany, New York 12237.